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Capturing knowledge of police investigations: towards a research agenda

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The purpose of this paper is to articulate a set of interlinked research propositions about knowledge management systems in relation to police investigations and in particular the possibilities of capturing the investigative knowledge inherent in how experienced police understand the investigative process. Moreover, the paper addresses missing links in the literature between 'know-what' and 'know-how' relationships between knowledge management systems and police investigations. A series of policy recommendations are also outlined in relation to this research agenda.

Keywords: stages of growth; value shop; knowledge resources; detectives; investigative thinking styles; investigation performance; communities of practice; tacit knowledge

Introduction

Capturing the knowledge that underpins a police investigation is a key task for an investigator. In fact, catching criminals cannot happen until an investigator first captures the 'knowledge' provided by forensics, intelligence, and interviewing victims, witnesses, and interrogating suspects.

Hence, this paper is a hypothesis building exercise into how to best capture the sort of investigative knowledge which is more likely to promote successful police investigations. We conceptualize from a research point of view how investigative knowledge can be surfaced in the thinking styles of detectives/investigators and linked to knowledge management systems and the technologies that underpin knowledge creation and transfer.

Given that our focus is limited to the investigative dimension of policing this does not imply that policing is only about crime control nor does it downplay the importance of community policing, public order maintenance, and the protection of civil liberties and human rights which is central to the notion of policing in a democracy (Engel & Burruss, 2004).

The importance of this paper lies in the set of innovative research propositions presented and discussed which seek to address the missing links in the literature between 'know-what' and 'know-how' relationships between knowledge management and police investigations. 'Know-what' has stressed the importance of knowledge in police work. This paper makes a much-needed contribution to 'know-how' as it explores and sets out a future empirical research agenda about how to capture investigative knowledge in order to better manage police investigations.

Initially, the paper outlines the propositional methodology used to hypothesize about the two interlinked domains of research interest – that of police investigations and knowledge

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management. This section also articulates the various sources of empirical evidence within each of these two domains that is used to map out four interlinked research propositions which follow. Finally, the paper concludes with a discussion of various policy recommendations for future research.

Propositional methodology for research

The task in this section is to conceive of and begin to map out an initial set of research propositions that relate knowledge management systems to the various investigative processes selected for their research potential within the larger domain of police investigations in general.

Such a propositional methodology is an inductive–deductive exercise of hypothesis building based on distinct sources of empirical evidence drawn from the two key domains of interest for this paper which are examined below. The first domain is that of Police Investigations, with a particular emphasis on investigative knowledge conceptualized as investigative styles of thinking as our focal research interest, and the second domain is Knowledge Management, with a specific focus on the technological systems in use by police to capture investigative knowledge.

Domain 1: Police Investigations

The source of empirical evidence in this domain comes from a phenomenographic[1] research methodology applied by the first author (Dean, 2000; Dean, Fahsing, & Gottschalk, 2006) to police investigations. His phenomenographic research on police investigative thinking styles found the existence of four such cognitive styles. Essentially the four styles are labeled as the 'Method,' 'Challenge,' 'Skill,' and 'Risk' styles of investigative thinking by police detectives. These cognitive styles are a form of tacit police knowledge contained in the heads of experienced police.

In regard to the first 'Method' thinking style when handed a case to solve detectives apply the method they were trained in (Dean, 2005). Such a method will more or less follow a set of five basic procedural steps: collecting, checking, considering, connecting, and constructing.

A review of the literature on police investigations shows that the police procedural 'Method' style of thinking has been extensively written about since the early 1950s beginning with a seminal text by O'Hara and O'Hara (1956 [1988]). There have been several other books since then that very much mirror this earlier text. For example, Jackson (1962); Soderman and O'Connell (1962); Sennewald (1981); Buckwalter (1984); International Association of Chiefs of Police (1989); Myren and Garcia (1989); Macdonald and Haney (1990); Osterburg and Ward (1992); Arcaro (1993); Gilbert (1993); Wilson (1993); and Kinnee (1994). The core of all these investigative methods is a reliance on a set of basic procedural steps to follow throughout an investigation. While the sequence and timing may vary depending on 'which' method a detective is applying from their preferred selection in the training literature, the 'basics,' for want of a better word, remain essentially the same. Hence, it is clear that the five steps of the Method style of thinking as identified by Dean (2000) and tested with a group of Norwegian police officers (Dean et al., 2006), that of '*collecting–checking–considering–connecting–constructing*,' are consistent with the literature.

With regard to the second investigative thinking style of 'Challenge,' when detectives conduct a serious and/or complex investigation, they become driven by the intensity of the challenge, which motivates them to do the best job they can for the victim(s) by catching

the criminal(s) and solving the crime through the application of their investigative method. The policing literature on the 'Challenge' style of investigative thinking reveals a body of research that identifies such a challenge as being essentially driven by a central and defining quality that of the 'intensity' of the challenges faced by investigators. For example, a Home Office (1991) study described 'drive/determination' and 'copes under pressure' as two out of the eight 'core competencies' they identified as necessary for detectives. Similarly, Wigfield (1996) found a 'drive to achieve' as a core competency within the Sussex Police. Also, police have to deal with a range of issues to do with the *nature of the job* (Ainsworth, 1998; Maguire, Noaks, Hobbs, & Brearley, 1993; Morgan, 1988; Waegel, 1981); the *types of crimes* investigated and mental analysis involved (Brandl, 1993; Gilbert, 1993; Home Office, 1991; McGurk, Gibson, & Platton, 1992; Wigfield, 1996); the *criminals* they deal with and the battle of wits that takes place (Hobbs, 1988); as well as the effects of the indignities suffered by *victims of crimes*. Empirical research suggests that the more emotionally devastating the crime is for victims then the more potentially motivated or 'driven' detectives become (Baldry & Winkel, 1998; Regini, 1997).

With regard to the third investigative thinking style of 'Skill,' in meeting the investigative challenge detectives require skill to relate and communicate effectively to a variety of people to obtain information so as to establish a workable investigative focus. Such skill also requires detectives to be flexible in how they approach people and the case, while maintaining an appropriate level of emotional involvement towards victims, witnesses, informants, and suspects. In relation to the 'Skill' style of investigative thinking, this topic has received considerable interest both from practitioners and researchers (Smith & Flanagan, 2000). The empirical research clearly indicates that the most fundamental skill needed by investigators is the ability to communicate (Home Office, 1991; Maguire et al., 1993; McGurk et al., 1992; Morgan, 1988; Wigfield, 1996). In other words, the key ability is to be able to relate effectively to a wide and diverse range of people. Such 'relatability' is also associated in the literature with a sub-set of investigative skills concerned with being *mentally flexible* (Yuille, Marxsen, & Cooper, 1999), *emotionally detached yet involved* (Gercke, 1995; Stenross & Kleinman, 1989) as well as finding a *focus for the investigation* (Sullivan, 1998). In general police derive such an investigative focus through their use of 'interviewing skills' which is regarded as part and parcel of the core skill of communicative relatability. In this regard, the popular image of police as professional, skilled interviewers and forceful interrogators is not wholly supported by the empirical evidence (Baldwin, 1993). Empirical research does not provide unqualified support for the common folklore that detectives are skilled interviewers who are able to tell if someone is lying to them (Canter & Alison, 1997; Ekman & O'Sullivan, 1991; Gudjonsson & MacKeith, 1988; Kohnken, 1987; Vrij, 1994; Vrij & Winkel, 1993).

With regard to the fourth investigative thinking style of 'Risk,' as detectives exercise their investigative skill they seek to maximize the possibilities of a good result by taking legally sanctioned and logically justifiable risks across a wide latitude of influence. Such justifiable risk-taking requires detectives to be proactive in applying creativity to how they seek to discover new information and, if necessary, how they develop such information into evidence. The 'Risk' thinking style in the investigative literature revolves around the central process of 'proactivity.' That is, investigators being proactive in seeking and searching out information and evidence. Such proactivity requires *creative thinking* (McGurk et al., 1992; Pilant, 1992; Wigfield, 1996), as well as dogged determination *to discover new information* (Gilbert, 1993) and then to *develop it into evidence* (Morgan, 1988). Conceptually, the discovery process in any investigation can work either independently or in combination with the process of 'creativity' mentioned above. Furthermore, 'discovery' comes about

from investigators applying determination and confidence to a clear 'investigative focus' on the 'crime' so that new information can be found, especially with 'cold cases' (Regini, 1997). Finally, the development of information into evidence requires other traits or sub-skills. For example, Gilbert (1993) ranks 'curiosity' and 'intuition' as necessary qualities for investigators.

Domain 2: Knowledge Management

The source of empirical research for this domain is drawn from the field of Knowledge Management as a cross-disciplinary area of study. Within the police and law enforcement domain the scope of knowledge management in police work, in general, is discussed by Luen and Al-Hawamdeh (2001) in relation to two definitions of knowledge. These definitions are commonly referred to in the knowledge management literature as 'tacit' knowledge and 'explicit' knowledge (Polanyi, 1966, 1969). These two definitions of knowledge – explicit and tacit knowledge – give rise to different implementation approaches, which are complementary rather than exclusive.

For example, explicit knowledge refers to any form of written documentation that makes 'explicit' and hence available through the policies and practices of an organization. With regard to policing this would include such documents as operational policies, general policing orders, standard operating procedures, and so forth. Thus, explicit knowledge is used in a command and control fashion to guide police actions and decision-making. As such, the implementation of explicit knowledge throughout an organization is relatively easy to do via policy documents, operational orders, intranet newsletters/update notices, and the like as noted.

Tacit knowledge, on the other hand, is 'implicit' knowledge that is gained through individual experience and action and is therefore very much learnt on the job. It is also referred to in the organizational psychology literature as a form of everyday 'practical intelligence' or 'practical experience' (Sternberg et al., 2000; Sternberg & Horvath, 1999; Sternberg, Wagner, Williams, & Horvath, 1995). With regard to policing and law enforcement, the bulk of tacit knowledge is comprised of the practical skills, competencies, and experience of individual police officers. Hence, tacit knowledge is difficult to document because of its individualistic, dynamic, changing nature, and quality as compared to documented or explicit knowledge.

Therefore, the implementation approaches used for tacit knowledge are generally restricted to apprentice-type strategies (team rotation, mentoring, buddy systems, and so forth). The approach taken is to team up an experienced police officer with a novice in order to pass on the tacit knowledge built up over years of experience. How such 'passing on' occurs precisely and how accurate and/or successful it is still remains a relatively unknown phenomenon. What is known is that such a one-on-one approach takes a very long time before the assumed assimilation of shared tacit knowledge may become evident in the work practices of the novice using this apprentice model.

In this regard, while criminal investigation is one of the pillars of police work along with the maintenance of public order and crime prevention and the protection of human democratic rights (Engel & Burruss, 2004; Mawby, 2003; Newburn, 2003; Tilly, 2003; Wright, 2002) it is still perceived as the 'pinnacle' of police work within the police culture. Detectives are at the top of the status pole (Foster, 2003) with their own brand of 'investigative culture' (Innes, 2003; Maguire, 2003; Wright, 2002) as the medium through which tacit knowledge of investigative practices is passed on to new investigators by more seasoned officers as they show them 'the ropes' (Dietz & Mink, 2005).

However, from a knowledge management point of view, what is clear is that explicit and tacit knowledge implementation approaches are both, complementary and necessary, if a police organization wants to fully realize the benefits of knowledge management.

Mapping out cross-domain research propositions

Figure 1 provides a conceptual map of the four research propositions developed in this paper that relate to the overlapping domains of KMS and police investigation. This figure will be used to guide the discussion for a proposed future research agenda.

As can be seen, the domain of Police Investigations contains two research propositions. The first proposition relates to the notion of investigative activity as having a 'value shop' configuration. The second proposition relates to relative importance of various investigative thinking styles insofar as their utility in terms of the overlapping domain of Knowledge Management Systems is concerned. This KMS domain as indicated also contains the two remaining research propositions. As shown, the third proposition relates to various technological stages in the growth of a KMS. The fourth and final proposition relates to the issue of access to strategic knowledge resources with the domain of Knowledge Management. The rationale and supporting research evidence for each of these four research propositions will be outlined in turn under the appropriate sub-section.

Research Proposition 1 and investigation as 'value shop' activities

Police investigations can be innovatively conceived of as displaying the characteristics of a particular type of 'value configuration,' to borrow a term from the business management

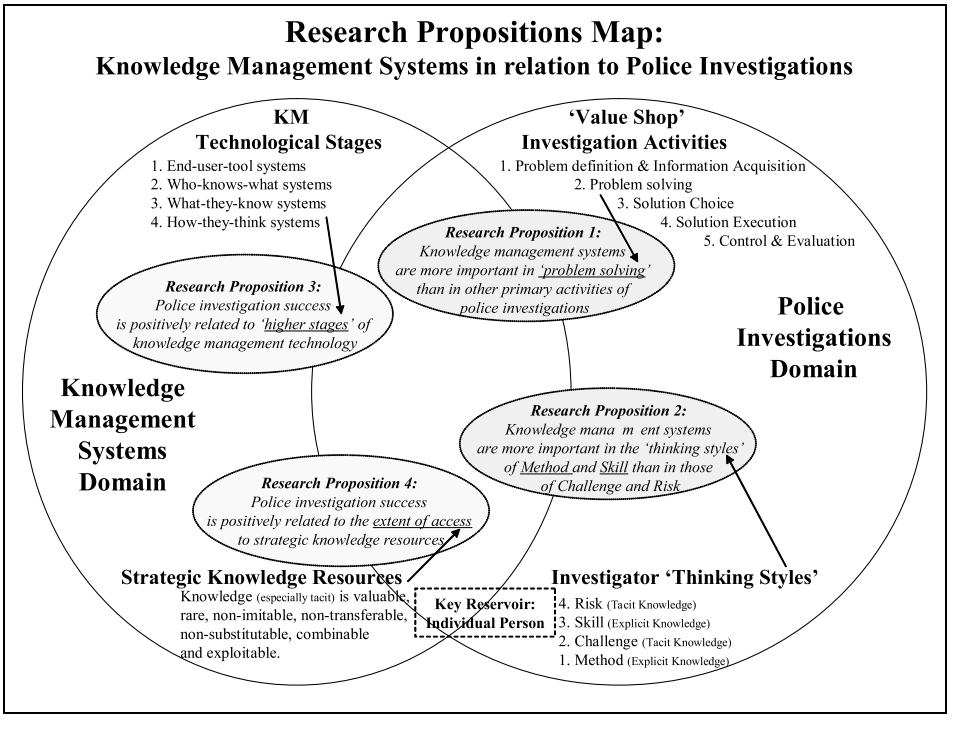

Figure 1. Conceptual map of research agenda and its propositions.

literature, that of a 'value shop' (Stabell & Fjeldstad, 1998). A 'value shop' schedules activities and applies resources in a fashion that is dimensioned and appropriate to the needs of the client's problem. Examples of value shops are professional service firms, as found in medicine, architecture, engineering, and law. We argue that the police investigation process has the value configuration of a 'value shop,' similar to law firms (Gottschalk, 2006). The value shop is an organization that creates value by solving unique problems. Knowledge is the most important resource. A value shop is characterized by five primary activities: problem finding and acquisition, problem solving, choice, execution, and control and evaluation, as illustrated in Figure 2.

As can be seen on Figure 2, these five activities are interlocking and while they follow a logical sequence, much like the management of any project, the difference from a knowledge management perspective is the way in which knowledge is used as a resource to create 'value' for the organization. Hence, the logic of the five interlocking 'value shop' activities in this example is of a police organization and how it engages in its core business of conducting reactive and proactive investigations.

Moreover, the basic requirements needed to develop a Knowledge Management System with the appropriate level of IT support are shown in the box at the bottom of Figure 1. A police example is the research by Adhami and Browne (1996) into the possibility of developing a Knowledge Based System for sexually oriented child homicides in England.

While all five interlocking investigative activities of a 'value shop' configuration have the potential of improving investigative performance, we argue that it is at the second phase of problem solving that knowledge management systems play perhaps their most

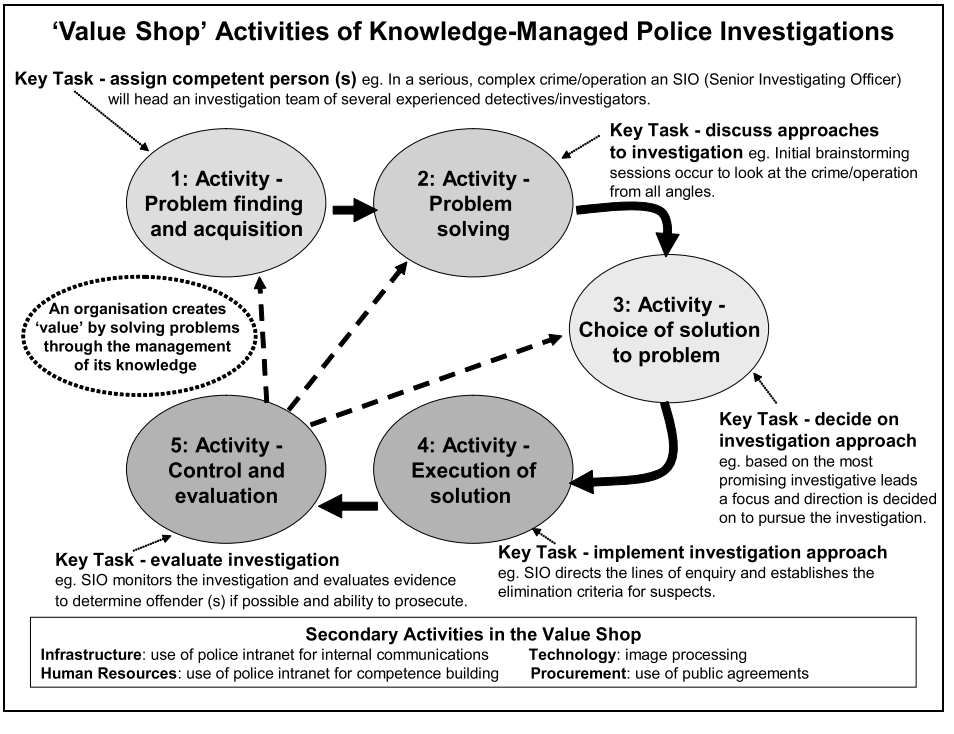

Figure 2. Police investigation as a 'value shop' activity.

important role in an investigation. Our rationale for this assertion is that this is the critical decision-making phase of an investigation for this is where an initial investigative approach is in the process of being decided on. All the other stages are dependent on this stage. That is, once the problem or crime has been looked at from all angles then an investigative path (stage 3) is set in motion. If subsequently this investigative path is proven to be a dead end then it is back to stage 2 to reconfigure the problem and its solution and find another way forward.

Hence, stage 2 – the problem-solving phase – is crucial to get it as right as one can first up in an investigation. Therefore, the importance of plugging in Knowledge Management Systems at this critical juncture (Afuah & Tucci, 2003) to ensure the best available resources are used to get it right first time round. The first 48–72 hours of an investigation are crucial to its success as the loss of vital information and evidence accelerates after this timeframe. Hence, our first research proposition can be stated as:

Research Proposition 1: Knowledge management systems are more important in problem solving than in other primary activities of police investigations.

Research Proposition 2 and investigator's thinking styles

Nested within the first research proposition that police research efforts should be focused on developing Knowledge Management Systems that concentrate on enhancing the activity of how 'problem solving' takes place within investigations, is a second proposition based on the empirical research by Dean (2000). His research as noted previously identified four qualitatively different thinking styles (method–challenge–skill–risk) that investigators rely upon to guide them in solving crimes.

These four ways of thinking can be related to the codification vs. the personalization strategy for knowledge management systems suggested by Hansen, Nohria, and Tierney (1999). Thinking styles 1 (Method) and 3 (Skill) are based more on explicit knowledge available in the research literature as previously outlined and are therefore more suitable for codification. Whereas thinking styles 2 (Challenge) and 4 (Risk) while written about in the literature are more problematic to research because they are more tacit knowledge based. In this regard the 'Challenge' style of investigative thinking is driven by a range of internal intensities that police investigators face (Home Office, 1991). In terms of the 'Risk' style of investigative thinking the qualities of 'curiosity' and 'intuition' which are elementary to this risk style of police thinking are according to Gilbert (1993, p. 38) '… often the result of a combination of experience and training.' Hence, developing reliable research tools for such subjective tacit aspects is a difficult task and one that has a way to go in the research literature.

Therefore, our rationale for the second research proposition concerning the relative importance of these four styles of investigative thinking insofar as KMS are concerned is that the thinking styles of method and skill are theoretically more able to be explicated and codified for investigative training manuals and applied in a knowledge management system than the more elusive investigative thinking styles of challenge and 'risk.' These latter two styles are essentially based in the tacit knowledge of experienced detectives and are therefore by definition not as ready able to be made explicit. Hence, our second research proposition is:

Research Proposition 2: Knowledge management systems are more important in thinking styles of method and skill than in the thinking styles of challenge and risk.

Research Proposition 3 and stages of knowledge management technology

Information technology that can support the knowledge work of police investigators is improving. According to Chen et al. (2002, p. 271), 'the problem is not necessarily that the information has not been captured – any officer who fills out up to seven forms per incident can attest to that. The problem is one of access.'

Generally in police and law enforcement organizations data is captured most often on paper and only some time later is it coded into a criminal information database system. If the police organization involved has several databases then information retrieval can be time consuming and difficult, especially if the databases are incompatible.

Knowledge management systems can be defined in terms of stages of Knowledge Management Technology (KMT) as illustrated in Figure 3.

Stage I is labeled end-user-tool systems or person-to-technology, as information technology provides people with tools that improve personal efficiency. Stage II is labeled who-knows-what systems or person-to-person, as people use information technology to find other knowledge workers. Stage III is labeled what-they-know systems or person-to-information, as information technology provides people with access to information that is typically stored in documents (Kankanhalli, Tan, & Wei, 2005). Stage IV is labeled how-they-think systems or person-to-system, in which the system is intended to help solve a knowledge problem.

Police officers often need to document the manner in which they have drawn a conclusion. This document is used in legal proceedings to justify subsequent actions. According

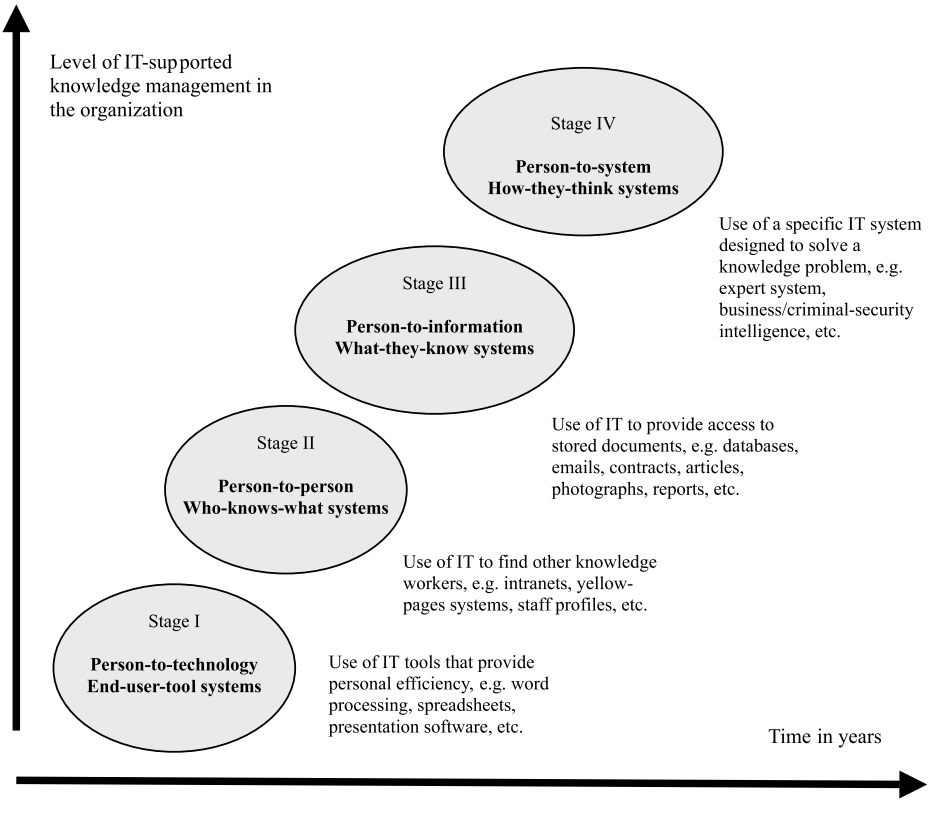

Figure 3. Stages of growth model for knowledge management technology.

to Chen et al. (2002), an officer may have to fill out up to seven forms per incident. This is a typical example of technology use at stage I. The use of relational database systems like COPLINK Connect and COPLINK Detect (Chen et al., 2002) and the HITS system (Homicide Investigative Tracking System) for crime-specific cases such as gang-related incidents, and serious crimes such as homicide, aggravated assault, and sexual crimes, has been proven to be highly effective in solving such cases (Keppel & Weiss, 1993). These systems are typical examples of information technology at stage III.

With regard to expert systems, they can aid in producing meaningful information retrieval by drawing upon human heuristics or rules and procedures to investigate tasks. An example of information technology at stage IV in police investigation work is an expert system like the Artificial Intelligence Crime Analysis and Management System (AICAMS) developed in collaboration with the Chinese University of Hong Kong and the Hong Kong Police Force which is used for economic crimes.

Of course, some KMTs in this stage of growth model can cross over into more than one stage. For example, geodemographic profiles and geocomputation systems (Ashby & Longley, 2005) are IT applications that belong to both stage I as a tool and stage III as an information source. Also, first generation closed-circuit television (CCTV) systems are found at stage I, while second generation 'thinking eye' (CCTV) systems belong to stage II of the KMT stages of growth model. The main difference between first and second generation surveillance is the change from a dumb camera that needs a human eye to evaluate its images to a computer-linked camera system that evaluates its own video images (Surette, 2005).

In the light of the stages of Knowledge Management Technology the following research proposition was developed:

> *Research Proposition 3: Police investigation success is positively related to stage of knowledge management technology.*

We argue that a police investigation unit will find greater support in their work at higher stages of the growth model for knowledge management technology. This proposition is also congruent with the first proposition about the importance of knowledge management systems for police investigations being focused on problem-solving activity. Clearly, problem solving is a higher order thinking skill and a matching up of a stage IV 'how-they-think' KM system is required at this level in the investigation.

Research Proposition 4 and strategic knowledge resources

Knowledge management in police investigations is knowledge intensive and time critical and thus presents a substantial challenge to investigation managers. Successful investigation depends upon knowledge availability (Chen et al., 2002). Police officers have to keep up to speed with the current legal and policy directions in relation to their work. Furthermore, they need to know the latest information on crime trends and potential threats to perform their duties effectively and efficiently (Luen & Al-Hawamdeh, 2001). We argue this presents a considerable challenge for knowledge sharing in a police service.

Knowledge management is concerned with simplifying and improving the process of sharing, distributing, creating, capturing, and understanding knowledge. Hence, our argument is that knowledge is the most important resource in police investigations. Therefore, we can apply the knowledge-based perspective on organizations, which is derived from the resource-based theory of the firm to policing by stating that knowledge as a

'strategic resource' is characterized by being valuable, scarce, non-imitable, non-transferable, non-substitutable, combinable, and exploitable. In this regard, Garud and Kumaraswamy (2005) argue that knowledge has emerged as a strategically significant resource for the firm.

If a resource is not valuable, that resource will not enable a firm to choose or implement strategies that exploit environmental opportunities or neutralize environmental threats. If a resource is valuable, but not rare, exploiting this resource in conceiving and implementing strategies will generate competitive parity and normal economic performance. Exploiting these valuable-but-not-rare resources will generally not create above-normal economic performance (Barney, 2002).

If a resource is valuable and rare, but not costly to imitate, exploiting this resource will generate a temporary competitive advantage for a firm and above-normal economic profits. A firm that exploits this kind of a resource is, in an important sense, gaining a first-mover advantage, because it is the first firm that is able to exploit a particular resource. However, once competing firms observe this competitive advantage, they will be able to acquire or develop the resources needed to implement this strategy through direct duplication or substitution (Barney, 2001).

If a resource is valuable, rare, and non-imitable, exploiting this resource will generate a sustained competitive advantage. If the resource in addition is non-transferable, the competitive advantage remains even when people and systems leave the firm to join the competition. Furthermore, if the resource is non-substitutable, the competition is unable to achieve similar performance using other resources. In addition, a resource increases in value when it is combined with other resources.

If a firm with a resource that is valuable, rare, non-imitable, non-transferable, non-substitutable, and combinable, is disorganized, some of its potential above-normal return could be lost. If the firm completely fails to organize to take advantage of this resource and therefore being unable to exploit the resource, it could actually lead the firm that has the potential for above-normal performance to earn normal or even below-normal performance (Barney, 2002).

With regard to the focus of this paper on police investigations, knowledge is the most important strategic resource that police as a 'firm' use to solve their particular crime problems. If police fail to fully utilize this resource then their return-on-the-investigative investment will be lower. Therefore, the fourth and final research proposition is:

Research Proposition 4: Police investigation success is positively related to the extent of access to strategic knowledge resources.

Discussion and conclusions

The four research propositions presented above reveal how they can be theoretically and logically interrelated to the two intersecting domains of police investigative knowledge, particularly in relation to styles of investigative thinking, and knowledge management systems in order to increase investigative success. This is all well and good in theory as it brings a clarity and intellectual rigor to police research. However, in practice the reality of policing and trying to research it is far from neat and tidy.

Police like people in general think interactively and holistically about solving crimes and the process can be far more chaotic than rational at times. Moreover, although experienced detectives and investigators intuitively know about and can potentially use a mixture of these four levels of thinking in an investigation, it is rare that any one detective will give

equal weight to all four styles of investigative thinking in a particular case. This is because detectives like everyone else, have a preference for maybe one or two particular styles or ways of thinking.

Furthermore, not all cases will require the use of all four investigative thinking styles to solve them. However, as time marches on in an investigation without a result then other styles of investigative thinking will need to come into play to increase the likelihood of a successful outcome. In essence, the more complex the crime the higher the investigative thinking style required to solve it.

Hence, these styles of investigative thinking should not be understood as mutually exclusive nor should the various stages of KM technological systems. Finally, how much these styles of investigative thinking can be learned and then shared using KMS is a moot point and one that future research should help to unravel.

For the moment the following policy recommendations are tentatively suggested as a potential way forward towards a suitable research agenda for capturing knowledge about police investigations.

Policy recommendations

With regard to the first research proposition it underscores how important and central the initial 'problem-solving' process is to everything that follows in an investigation. Hence, it is recommended that investigative KMS should incorporate a 'context marker' type system similar to the 'red flag' concept in intel work where a person considered to be relatively 'outside' of the immediate investigation and with substantial rank like a SIO (senior investigating officer) is required to check both the way the problem is defined and the solutions proposed with the investigating officer before any action is initiated.

Having such a system in place should substantially reduce the type of human errors of judgment that can occur in policing because the implications of a solution taken have not been properly discussed and vetted before implemented by someone 'outside' of the investigation.

A case in point was the situation in 2006 when a huge public outcry that took place after nine young Australians where arrested in Bali on drug charges due to a tip off to the Indonesian police from the Australian Federal Police (AFP). At the time the AFP knew that such an arrest in Bali would almost certainly mean the death sentence for some of these young people. If 'democratic policing' in a country like Australia means doing all to ensure that a citizen's rights are protected then such a tip off must be seriously challenged as a failure of judgment, especially in the legal light that Australian policy condemns the use of the death sentence for drug crimes. Hence, this policy recommendation is essentially a risk management strategy to ensure democratic policing does in word and deed protect the human rights of its citizens.

The second research proposition draws on the distinction between 'explicit' and 'tacit' knowledge implementation approaches and as such two policies are implied.

Firstly, in relation to the more 'explicit' knowledge structures of the 'method' and 'skill' styles of investigative thinking it is recommended that these styles be formally incorporated into a KMS training curriculum.

Secondly, with regard to the more 'tacit' knowledge structures of the 'challenge' and 'risk' styles of investigative thinking it is recommended that a formal knowledge capture system be developed to map out the tacit investigative thinking pathways used by individual investigators on solved crimes in order to establish a knowledge repository specifically for investigations.

The third research proposition highlights where money needs to be spent in acquiring or developing KMT which is at the 'high end' stage of purpose-built 'expert' systems in the domain of police investigations. There is a need for a specific policy recommendation in this regard as the competing demands within policing to fund a range of projects will mean that unless a policy directive is established to fund such purpose-built expert investigative systems then good intentions will fall by the financial wayside.

The fourth and final research proposition logically follows from the one above. In that unless a police organization takes very seriously the notion that 'knowledge,' in both explicit and tacit forms, is the most important strategic resource the organization has to do its job effectively and efficiently, especially in the domain of police investigations, then knowledge management will remain only a fad to be dispensed with when a new fad arrives on the policing horizon. To avoid this loss of KM potential it is recommended that a formal policy on KM be instituted by the executive management team of police organizations in order to begin, continue, and/or reinforce sending the message that 'police knowledge is valued' by the organization as well as each individual officer's part to place in knowledge capture, creation, sharing, transfer, and application.

Notes

1. Readers may not be familiar with what a phenomenographic research methodology entails. Hence, a brief overview is provided. Phenomenography is an empirical research method that is used to map out the qualitatively different and critical ways in which some phenomena are experienced by people in their life-worlds. Hence, it is the 'variation' in *ways of experiencing something* that is the object of research for phenomenography (Marton, 1986, 1988, 1994, 1996). This variation in 'ways of experiencing,' which are expressed as 'conceptions' at an individual level, is captured at the collective level in a set of 'categories of description' which represent the limited number of ways in which any phenomena can be experienced by people. The underlying assumption is that there are regularities or commonalities between experiences that represent a system of conceptual order (categories) about people's collective experience of reality (Svensson, 1994).
2. The 'outcome space' for a phenomenographic study represents the categories of description, which are the results of the research, as comprising a logically structured hierarchy of increasing complexity about the phenomena under study (Marton & Booth, 1997; Uljens, 1996). The validity of 'phenomenographically interpreted' findings in the form of a system of descriptive categories (outcome space) is based on the data available. Therefore, the reliability of phenomenographic data, also depends on demonstrating that each 'category of description' explicated from the 'data pool' is *distinctively different*, yet *logically interrelated* to one another, and that the whole system of categories is *parsimonious* (i.e., to have as few categories as possible to capture the variation in experience). This 'system of categories' is not an *exhaustive* system but it should be a *comprehensive* system for the group studied (Sandberg, 1997).

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